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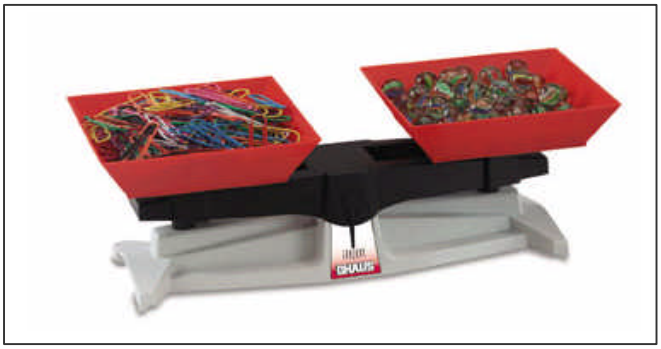

Ohaus School Balance
Model SB1200

- OPERATING MANUAL -

- Accurate and simple to use
- Durable lightweight plastic for easy clean up and long life

General Product Features

- **Interchangeable Red Pans:** Allows user to place a variety of objects for weighing. Removable for easy clean up.
- **Tare Poise:** Located on the rear of the beam, allows user to zero balance before weighing.
- **Recessed handles in base:** Allows the transport of the balance without disturbing the contents.

Balance Setup

- Remove balance from carton.
- Make sure that pans are placed securely on pan supports.
- Slide poise until pointer is lined up with center of graduated lines.

Weighing

To determine weight of object

- Make sure that pointer is lined up with center graduation.
- Place object to be weighed on one pan. The pointer will swing to the opposite side.
- Place masses on other pan until the pointer is again lined up with the center graduation.

To compare the weights of two objects

- Make sure that pointer is lined up with center graduation.
- Place first object to be weighed on one pan. The pointer will swing to the opposite side.
- Place second object on other pan. The pointer will point away from the heavier object.

Available Accessories

- 8 piece mass set 50 g x 1 g (241-03)
- 12 piece mass set 500 g x 1 g (200-16)
- 13 piece mass set 1000 g x 1 g (201-16)

Replacement Parts

- Red pan (2743-00)
- Pointer (80250837)
- Tare poise (80250839)
- Poise retainer (80250840)

EXPERIMENTS

Hot Air/Cool Air

Objective
To determine which is heavier- hot air or cool air

Materials
- Two 8 ½" x 11" cardboard tablet backs
- Hair dryer or 75+ watt lamp bulb
- Small paper bags
- Ohaus SB1200 School Balance

Procedure
1. Place the cardboard pieces on each balance pan with a paper bag upside down on each piece of cardboard. Zero the balance.
2. Remove one of the bags and place over the lamp bulb for 2-3 minutes, being careful not to have the bulb touch the bag.

   or

   Using a hair dryer on high heat, fill the bag with hot air.
3. Without tipping the bag, place it back on the balance and observe the zero point.

Notes
- Which is heavier, hot air/cool air?
- Why is this so?(molecular motion)
- Talk about hot air balloons, ceiling fans, furnaces in the basement, molecular motion (solids, liquids, gasses)

Sugar in Soda

Objective
To show the relative amount of sugar in soda

Materials
- Same size can or bottle of regular and diet soda
- Sugar packets
- Ohaus SB1200 School Balance

Procedure
1. Place regular soda on the left pan and the diet soda on the right pan.
2. Add sugar packets to the right pan until the balance returns to a neutral position.
3. Remove the soda cans or bottles from the balance.
4. Empty sugar from the packets on to the left pan and weigh the sugar.

Note
The amount of error you will notice from your weighing and that which is on the can or bottle is caused by the following. The sugar in the soda is high fructose corn syrup. The diet contains aspartame and benzoic acid.

Limited Warranty

Ohaus products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period Ohaus will repair, or at its option, replace any component(s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to Ohaus.
The warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than Ohaus. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by Ohaus Corporation. Ohaus Corporation shall not be liable for any consequential damages.

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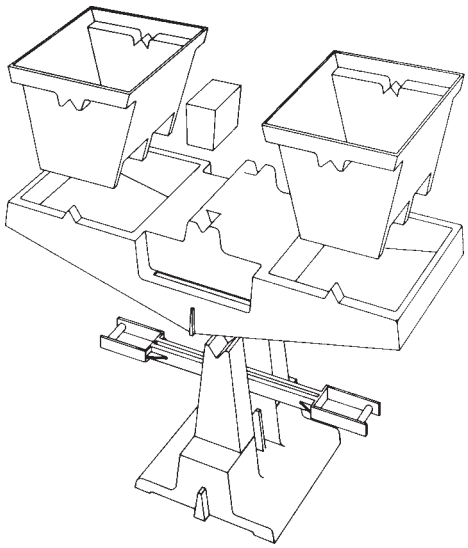
PRIMER BALANCE ACTIVITY GUIDE



Primer Balance

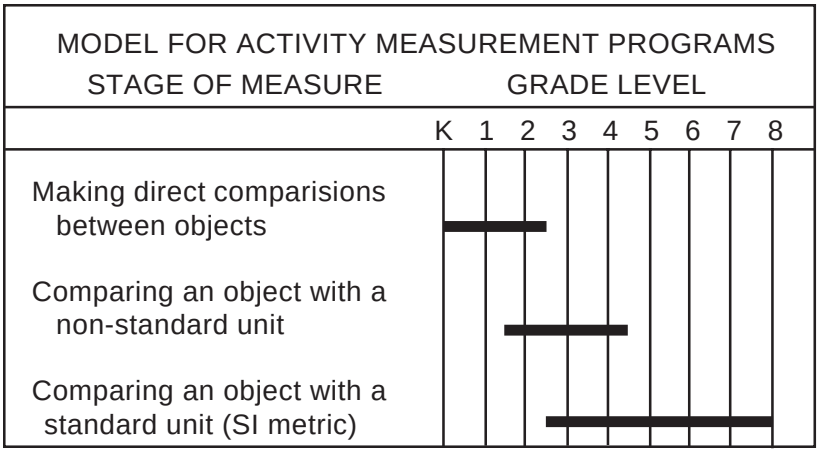
Accurate, simple to use, easy to clean and student proof. Your students' first introduction to the priciples of balancing are best demonstrated with this new design primer balance. 2000 g capacity, 1 g sensitivity.

PRIMER® BALANCE ACTIVITY GUIDE

INTRODUCTION

Children develop measurement concepts through interactions with objects in their environment. They gain these concepts by climbing trees, lifting toys, touching hot and cold surfaces, and doing a multitude of things called "everyday life". It is the role of the teacher to help the student integrate what he or she knows about the world with the formal lessons taught in the classroom.

An important part in helping students to integrate and expand their knowledge of measurement is to present lessons in a concrete form. A suggested teaching sequence for accomplishing this goal is shown below:


MODEL FOR ACTIVITY MEASUREMENT PROGRAMS
STAGE OF MEASURE
GRADE LEVEL
K 1 2 3 4 5 6 7 8
Making direct comparisions between objects
Comparing an object with a non-standard unit
Comparing an object with a standard unit (SI metric)

SEQUENCING ACTIVITIES FOR MEASURING MASS

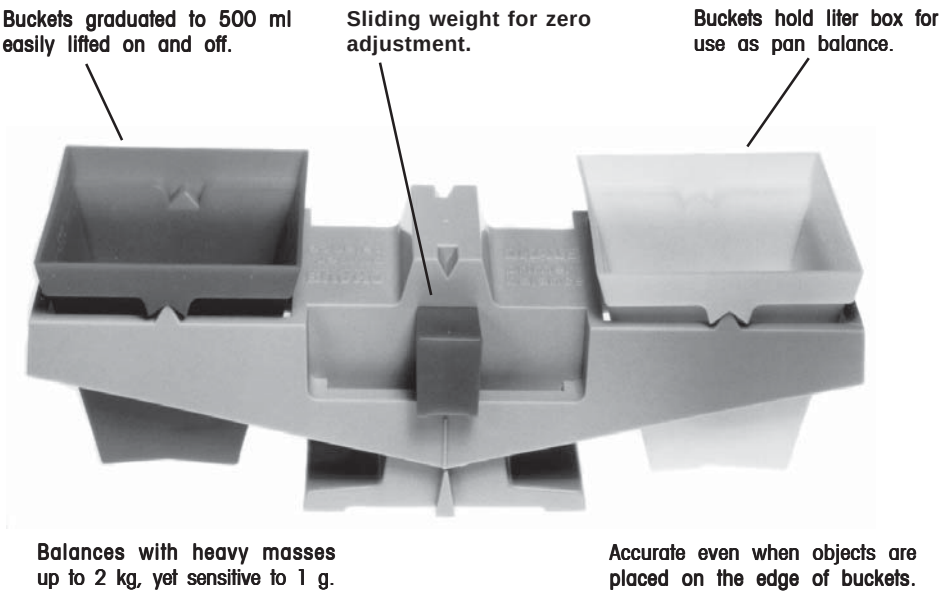
The chart above implies that students of any age should have experiences comparing the relative mass of objects using direct comparison techniques (using all five senses). As a student finds they are unable to decide which of two materials has the greater mass, they may elect to use a balance to resolve the problem.

Initial work with the balance can be carried out successfully using non-standard units of measure. The student can use almost any available object as his unit for comparison. Later, for convenience and accuracy, comparisons can be made using standard units.

USING THE PRIMER® BALANCE

The Primer Balance is rugged and can be used by students with the knowledge that it will not be damaged through normal use. The balance may be taken apart to see how it is constructed. Each of the balance pans may be loaded with all types of materials: sand, water, books, rocks, etc. Since there is very little that will cause damage to the Primer Balance, students may be given freedom to explore how it works.

After they have had an opportunity to explore the working of the balance on their own, the activities in this guide may be duplicated and introduced.


Buckets graduated to 500 ml easily lifted on and off.
Sliding weight for zero adjustment.
Buckets hold liter box for use as pan balance.
Balances with heavy masses up to 2 kg, yet sensitive to 1 g.
Accurate even when objects are placed on the edge of buckets.

does it balance?

OBJECTIVE: To make accurate comparisons of the mass of two similar objects.

MATERIALS: Primer Balance
Pairs of objects that have similiar but unequal mass.
For example:

2 rubber erasers (used)	2 pebbles
2 oranges	2 pencils (used)
2 crayons (used)	2 potatoes

PROCEDURE:

1. Check the reading on the front of the balance to see if it is in alignment. If it is out of balance, have your teacher show you how to adjust it.

2. Use a marking pen to mark each pair of objects. (Mark one object "A" and the other "B".) Weigh each pair of objects. List them and record the results by placing an "A" or "B" in the proper column in the following chart.

Objects	Heaviest	Lightest

Nonstandard

fruits and vegetables

OBJECTIVE: To use a balance to order objects by mass.

MATERIALS:

Primer Balance
One each:

Banana	Potato
Apple	Lemon
Grapefruit	Carrot

PROCEDURE:

1. Look at the fruits and vegetables: list them in order from the lightest to heaviest. Record your guess in the following chart.

2. Compare the weight of the fruits and vegetables to see if your guess is correct.

	Order by Guessing	Order by Weighing	
Lightest			Lightest
Heaviest			Heaviest

Nonstandard

nails

OBJECTIVE: To make comparisions of mass using a nonstandard unit of measure.

MATERIALS:

Primer Balance
Six small paper cups
Enough of the following material to each fill one cup:

Beans	Breakfast cereal
Rice	Salt
Cornmeal	Water

A cup of nails as mass pieces

PROCEDURE:

1. Measure a cup of each of the materials provided in this activity.
2. Guess the number of nails it will take to balance each of the materials.
3. Make a record of what you found. Use the following chart.

Your Guess (Number) of Nails)	Material	Actual Number of Nails
	Beans	
	Rice	
	Cornmeal	
	Breakfast cereal	
	Salt	
	Water	

how many cards?

OBJECTIVE: To make comparisions of mass using a nonstandard unit of measure.

MATERIALS: Primer Balance
A deck of playing cards
Some round objects:

Tennis ball	Ping pong ball
Golf ball	Super ball
Marble	Ball bearing

PROCEDURE:

1. Guess the number of playing cards that will equal the mass of the objects listed below.

2. Record your guess and then find the number using the balance.

Your Guess (Number of) of Playing Cards)	Object	Actual Number of Cards Needed to Balance the Object
	Tennis ball	
	Golf ball	
	Marble	
	Ping pong ball	
	Super ball	
	Ball bearing	

a lump of clay

OBJECTIVE: To gain an awareness of the relation that exist between the space occupied by material (volume) and the mass of that material.

MATERIALS:

Primer Balance
1 large lump of clay
Plastic cups
6 or 8 plastic bags with 1/2 gallon capacity
A supply of the following materials:

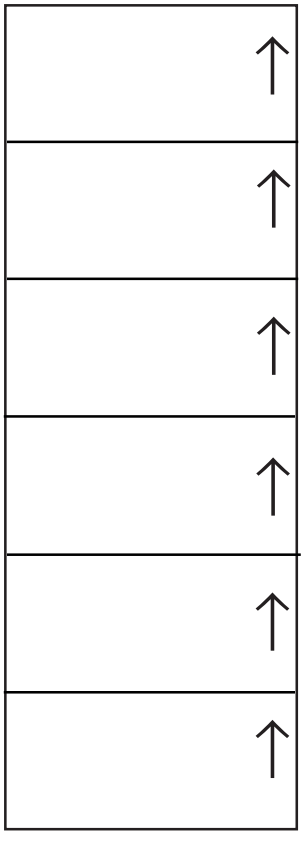
Styrofoam packing material	Cornmeal
Nuts (with shell on)	Beans
Breakfast cereal	Salt

PROCEDURE:

1. Place the lump of clay in one of the pans: then fill a plastic bag with an amount of material that will cause the scale to come into balance. You may need more than one plastic bag for some material.

2. Order the filled bags according to the amount of space the material takes up inside of each bag. Use the following chart.

3. Explain why some materials take up more space than others.



Material That Took Up the Least Space

Material That Took Up the Most Space

heavy water

OBJECTIVE: To use the mass of a liquid to make comparisons of mass with solid materials.

MATERIALS:

Primer Balance
Metric measuring cup
Plastic cups
A collection of solid materials such as:

Potato	Large pebble	Orange	A baseball
Apple	Coffee mug	Banana	Math book

PROCEDURE:

1. Place a cup (250 ml) of water in one of the balance pans.

2. Before comparing the mass of each object in your collection with the water, record your guess whether the object will have a mass that is "less than", "greater than", or "the same as" the water.

3. Measure and record your findings. Use the following chart.

Your Guess (Less Than, or The Same)	Object	Actual Mass of the Object: (check the correct column)		
		Less Than the Water	Same as the Water	More than the Water

small things

OBJECTIVE: To gain an awareness of how the mass of familiar objects compares to one gram.

MATERIALS:

Primer Balance
10 to 15 one gram mass pieces.
A collection of objects, such as:
Paper clips (small and large)
Brass paper fasteners
Coins (penny, nickel, dime, quarter, etc.)
Playing cards
Rubber bands (long ones and thick ones)

PROCEDURE:

1. Determine the number of objects (identical objects) that have a mass of a single object by dividing the number of objects it takes into 10 grams and record your findings. Use the chart below.

2. List the objects that have a mass of nearly one gram.

Number of Objects Equal to a 10 Gram mass	Object	Mass of a Single Object
	Penny	
	Nickel	
	Dime	
	Quarter	
	Small paper clip	
	Large paper clip	

Standard

the average egg

OBJECTIVE: To use averages to make decisions related to how an object is categorized.

MATERIALS: Primer Balance
3 each of small and 3 large eggs (hardboiled) 100 one gram mass pieces

PROCEDURE:

1. Use a felt tip pen to mark the size on each egg: "s" for small and "l" for large.

2. Find the mass of each egg according to its size: then calculate the average number of grams for each egg size. (To find the average, add the total mass of the eggs and divide the number of eggs.) Record your answers. Use the following chart.

3. Discuss whether or not weighing is a good way to determine egg size.

Small Eggs	Mass
Egg #1	_____ grams
Egg #2	_____ grams
Egg #3	_____ grams
Average mass of a small size egg = _____ grams	

Large Eggs	Mass
Egg #1	_____ grams
Egg #2	_____ grams
Egg #3	_____ grams
Average mass of a large size egg = _____ grams	

Standard

paper towels

OBJECTIVE: To solve problems that require accurate comparisons of mass

MATERIALS:
Primer Balance
One gram mass pieces
3 or 4 different brands of paper towels

PROCEDURE: To decide which brand of paper towel is better able to pick up spilled water:

1. Write the correct brand name corresponding paper towel with a pencil.

2. Weigh the dry paper towel: then soak up as much water as you can with the towel and weigh it again. Make a record of your measures for each towel in the chart

Brand Name of Towel	Measures of mass
	Dry towel _____ grams Water soaked towel _____ grams Amount of water in the towel _____ grams
	Dry towel _____ grams Water soaked towel _____ grams Amount of water in the towel _____ grams
	Dry towel _____ grams Water soaked towel _____ grams Amount of water in the towel _____ grams
	Dry towel _____ grams Water soaked towel _____ grams Amount of water in the towel _____ grams

balancing with water-i

OBJECTIVE: To discover the special relationship that exists between the weight and the volume of water.

MATERIALS:
Primer Balance
A graduated cylinder or beaker (graduated in ml)
100 gram mass pieces
A medicine dropper

PROCEDURE:

1. Place the number of mass pieces indicated in the following chart in one of the balance pans; bring the scale into balance by adding or taking away some of the water with the medicine dropper.

2. When the water and the mass pieces are in balance, pour the water from the balance pan into a graduated cylinder. Record the volume in milliliters.

3. Explain how you could use the relationship that exists between mass (weight) and volume of water to accurately measure the mass of an object.

Number of One Gram Mass pieces	Volume of the Water in Milliliters
10 grams	_____ ml
20 grams	_____ ml
30 grams	_____ ml
50 grams	_____ ml
100 grams	_____ ml

Standard

balancing with water-ii

OBJECTIVE: To measure the mass of an object by using a volume of water as the basis of comparison.

MATERIALS:

Primer Balance
A cylinder or beaker (graduated in ml)
A medicine dropper
Some objects to weigh, such as:

Orange	Rock
Apple	Piece of chalk
Wooden block	Sea shell
Piece of clay	Bag of sand

PROCEDURE: Estimate the mass of each of the objects you wish to measure in grams. Then using the balance, find the amount of water needed to balance the object. Measure the volume of the water to determine the mass of the object. Make a record of what you find.

Mass (Your Guess)	Object	Actual Mass

Standard

other activities

Duplicate the following activities and assign them as motivators.

ORANGE JUICE

How much juice can you get from an orange? See if you can determine the cost of fresh orange juice.

(Standard)

USED PENCILS

Each time a pencil is sharpened it loses some mass. What decimal fraction of your pencil have you used?

(Standard)

CHANGE FOR ONE DOLLAR

What is the most and is the least amount of mass that one dollar's worth of change can have?

(Standard)

A BEAN CONTEST

See who can predict the mass of 100 beans by being allowed to weigh at least five beans.

(Standard)

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